Quick Start

TM970020 Rev. F

April 14, 2009

OVERVIEW

The Cash Card Payment System is designed for the application of proximity cards of 13.56 MHz compliant with ISO 14443A. The idea is that consumers pay for all consumption by card instead of cash. First the proximity card needs to be programmed and stored with values or amounts by a Read/Write Device (RWD) PRW106. Then consumers bring the programmed cash card with them to the Reader end, AC906, AC908, etc, for transaction. Whenever the cash card is read by AC906, AC908, etc, the preset decrement will be deducted from the card and the new value or amount will be rewritten to it.

This system can also be applied in Access Control purpose. Please refer to “Reader End (AC906, AC908, etc)” hereafter for more details.

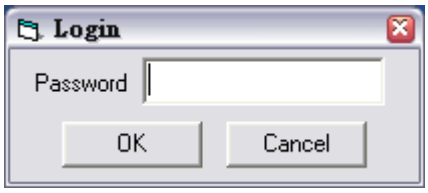
APPLICATION

-Access Control
-Admission Control
-Master and User Authentication Control
-Pre-payment
-Ticketing
-Public Transportation
-Prepaid Parking
-Prepaid Meal Coupon
-Home Security & Anti-crime Appliances
-Multi-application: Tracking, Retail, Customer, Loyalty, Leisure, Gambling

PROGRAMMER (PRW106)

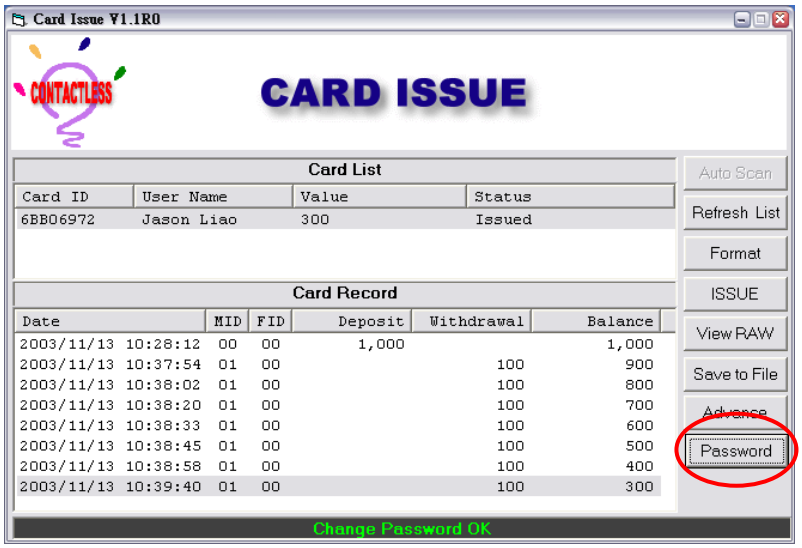
Install the program “CardIssue” from the enclosed CD and connect PRW106 with computer. Then run the “CardIssue” program and follow the steps below for operation.

Step 0: Log in CardIssue



For the first entry, just click [OK] to log in the program and then go to [Password] immediately to set the password for future login.

Note: Change the Password

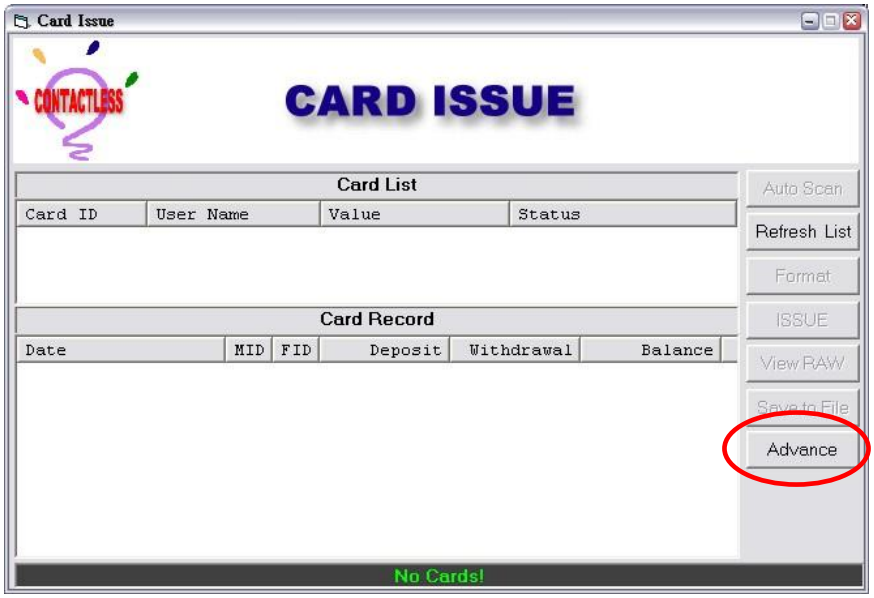


Click [Password] to change the password.

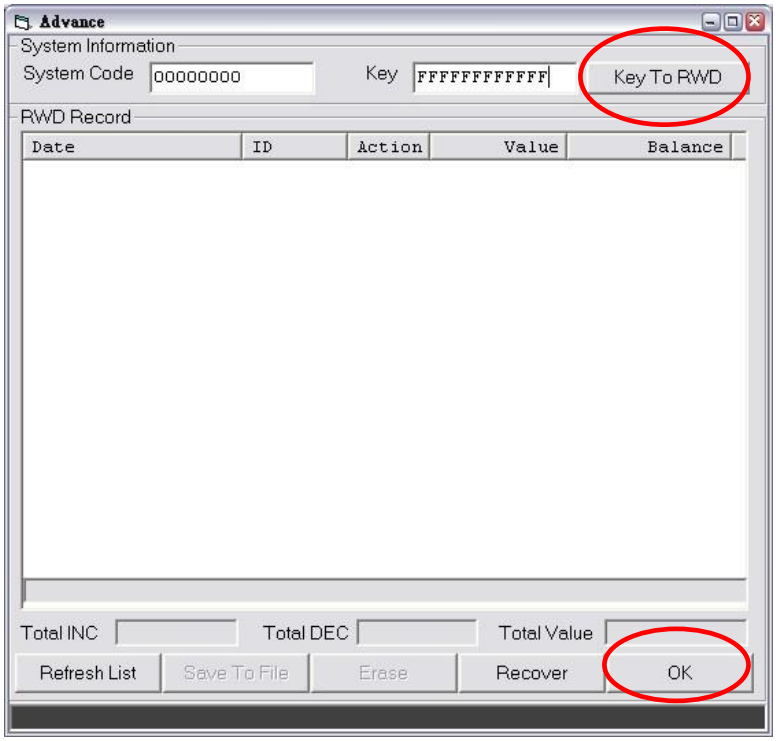
(**See Appendix-F**)

Step 1: Set the *System Code* and the *Key* to PRW106

To ensure that the card, the programmer and the reader are within the same operation system, there has to be a common system code set to all 3 ends. So does the key for the blocks of the card. This step is necessary and important. Both system code and key have to be well kept.



Run the "CardIssue" program and select [Advance].



Input *System Code* and *Key*, and then click [Key To RWD] to save the key to PRW106.

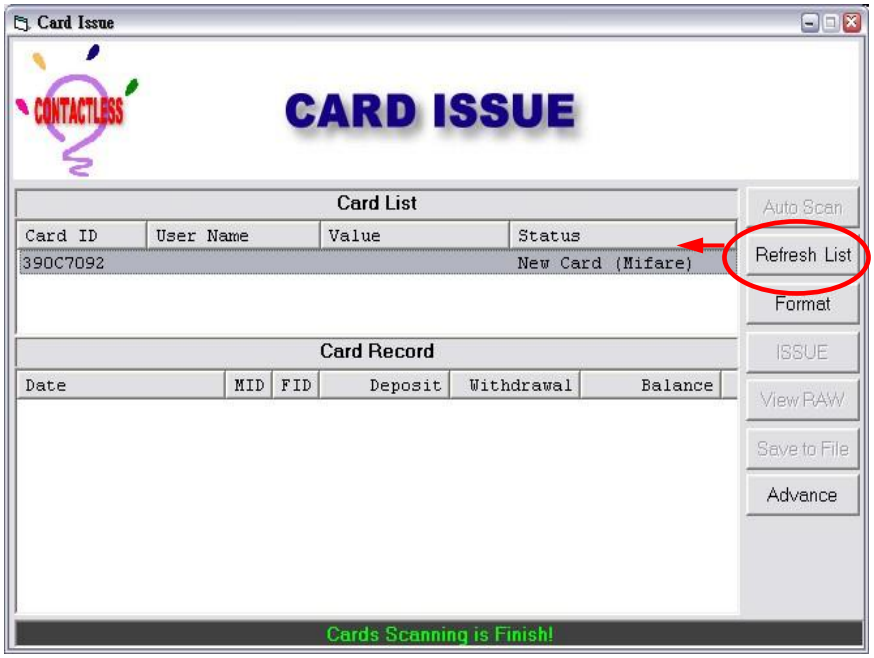
Default value (HEX):
System Code: 00000000
Key: FFFFFFFFFFFF

Click [OK] to end up the [Advance] setting.

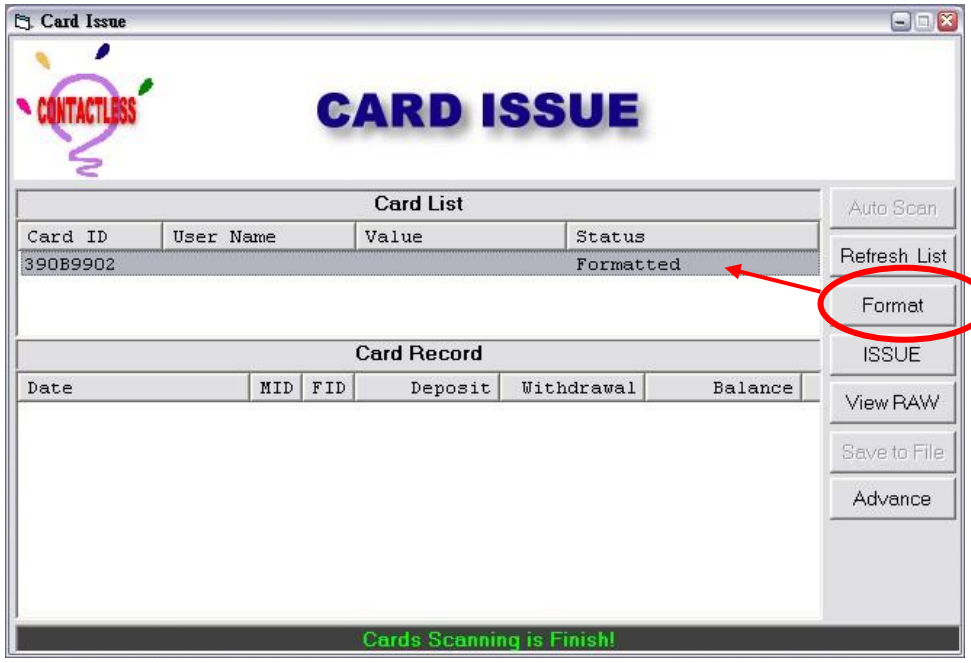
Remark:
About High Security, Please see **Appendix-F**

Step2: Format the card

Every new card must be formatted before being programmed to cash card. Insert a new card (ISO 14443A, size 1K or 4K) to PRW106, and then click [Refresh List].



After clicking [Refresh List], it shows the card number and status of the new card inserted in PRW106.



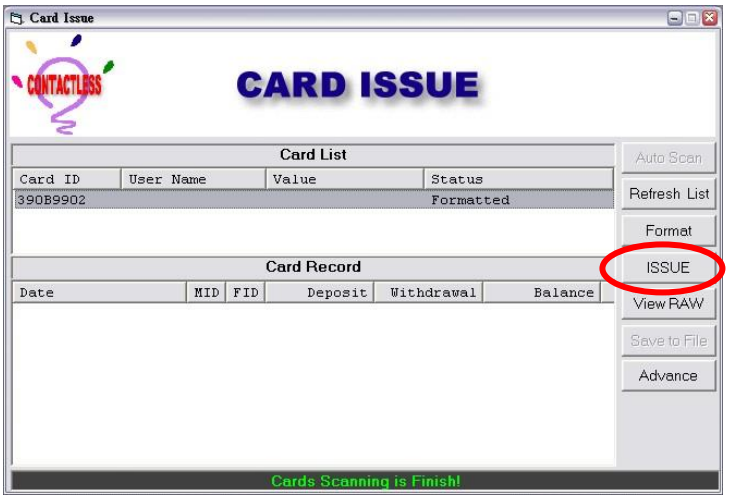
Click [Format] to format the new card. When it is done, the status of the card becomes "formatted".

Remarks:

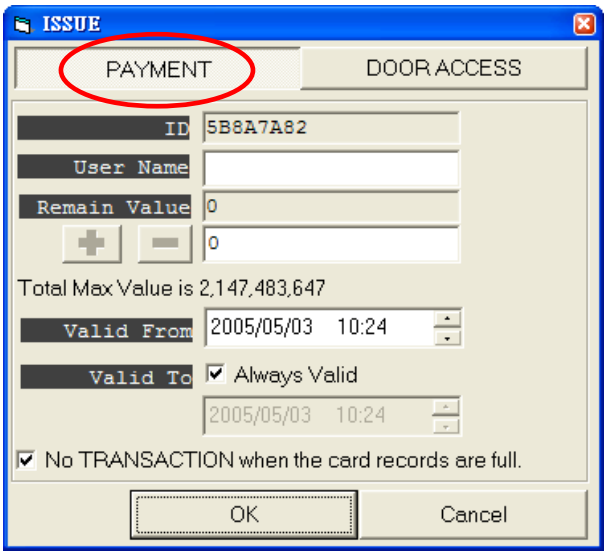
1. Suggestion: format some cards in advance before programming them to cash cards.
2. "Format" means writing the *System Code* and *Key* into the card.

Step 3: Issue the Cash Card

This step is to store the values or amounts to the formatted card.



Click [Issue] to start the process.

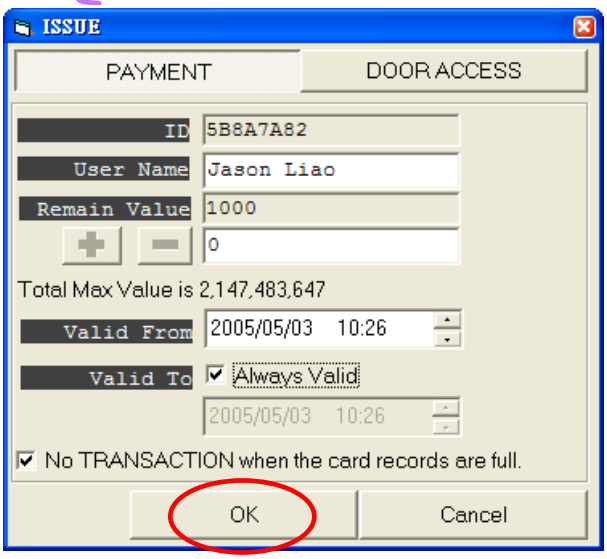


Input “User Name”

Input “Values” or “Amounts”
(Use button “+” or “-“ as “addition” or “deduction”)
Select “Issuing Date” & “Validity” of the card

Remark:

- **When “No TRANSACTION when the card records are full” option is enabled, users have to bring the card back to the reception to have the transaction list in the card read out and then deleted before they can use the card again.**
- **You must Save and Clear all records of Cash Card when the card records are full and the “No TRANSACTION when the card records are full” option is enabled. If not, the Cash Card can not be used. (See Appendix-F)**



For example:

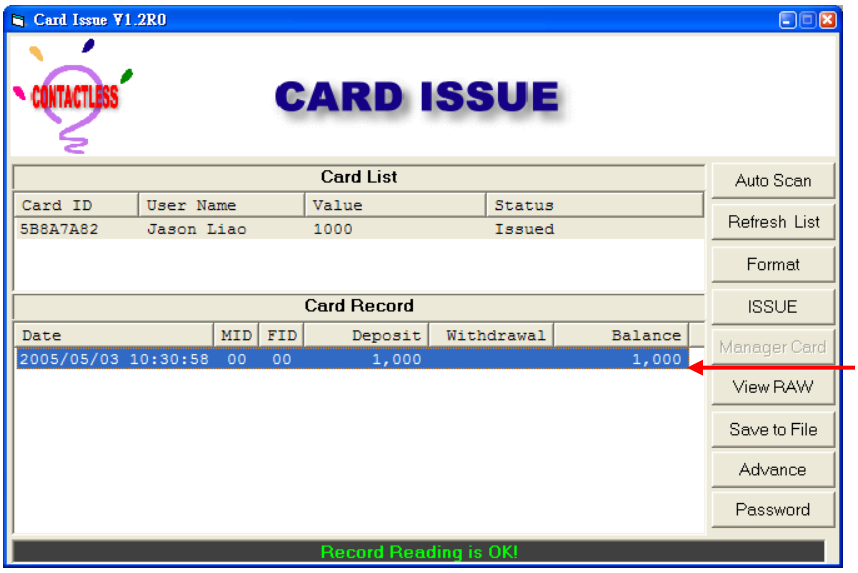
Input "Jason Liao" as User Name

Input "1000" and click "+", the remain value becomes "1000"

If further input "200" and click "-", then the remain value becomes "800".

Click [OK] to write the settings to the card.

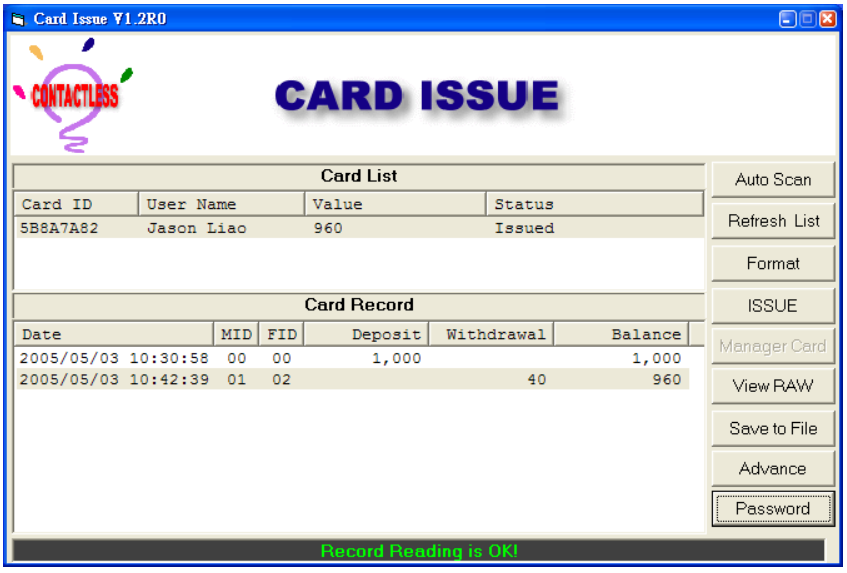
Step 4: After finishing the card issuing, review the record of the card.



Click [Refresh List] to get the card info.

The card has recorded the transaction of adding value "1000".

If the card has been taken to the reader end for transaction, you can review the records from the programmer as well.

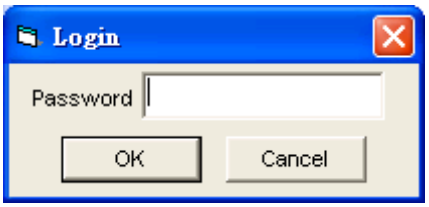


For example,
This card was taken to reader (MID=01& FID=02) for transaction. The decrement was 40 and the balance was 960.

READER END FOR OPERATION (AC906/AC908)

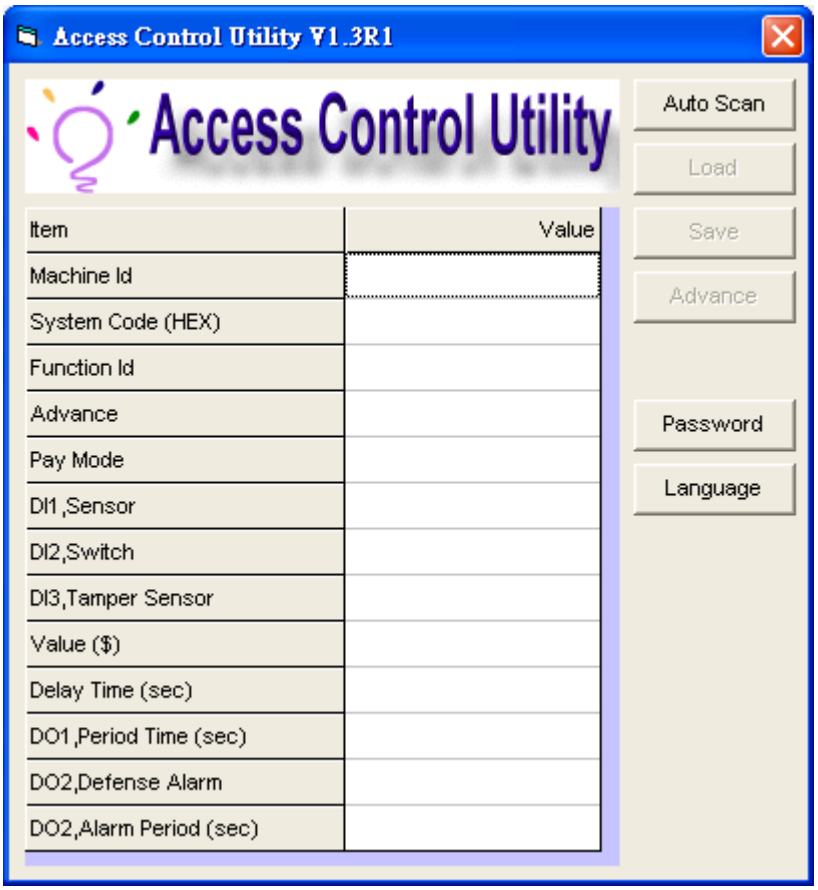
Install the program “Access Control Utility” from the enclosed CD and connect device with computer using cable WAS-1519 whose connector is with a socket for external 9V DC power supply. Follow the steps below to set up the properties of device.

Step 0: Log in Access Control Utility



For the first entry, just click [OK] to log in the program and then go to [Password] immediately to set the password for future login.

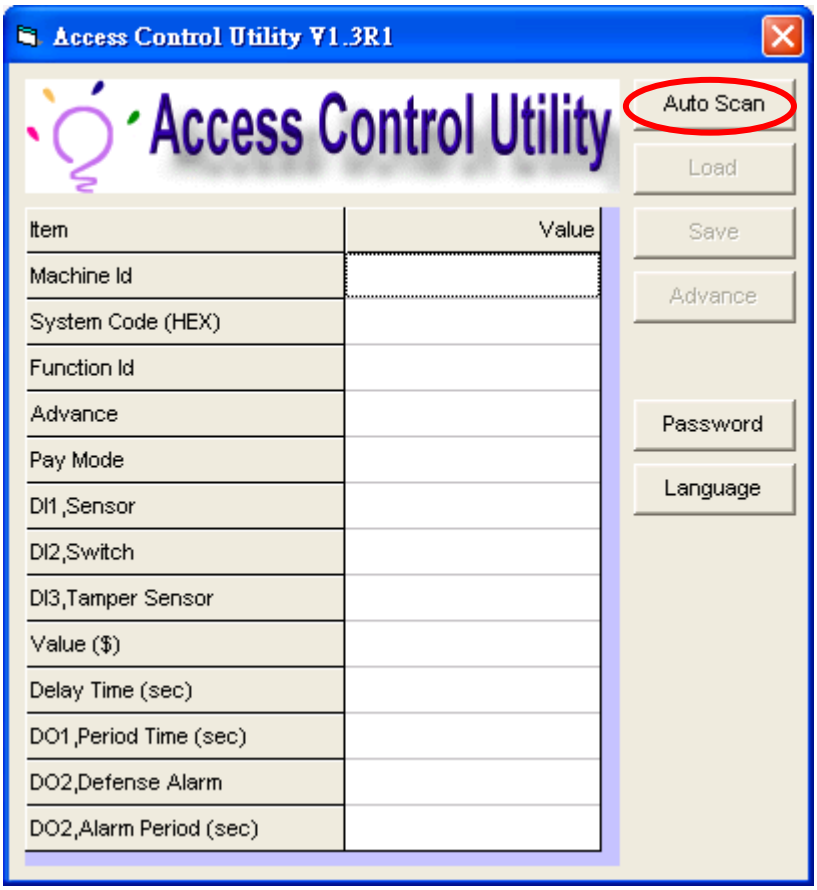
Note: Change the Password



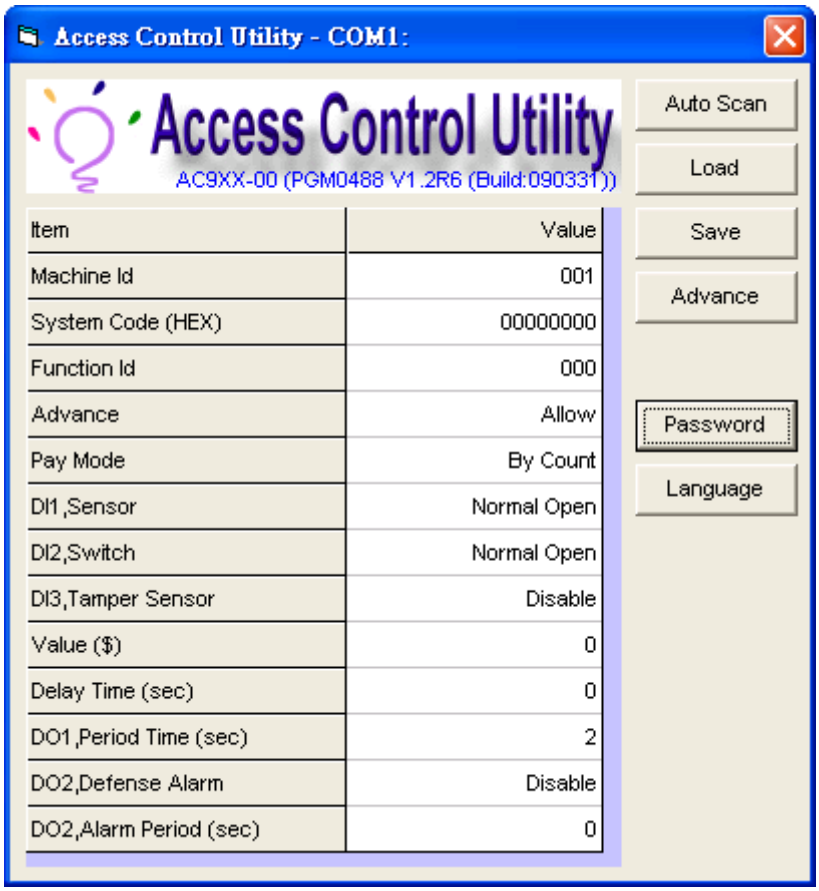
Click [Password] to change the password.

(See Appendix-F)

Step 1: Run “Access Control Utility” program.



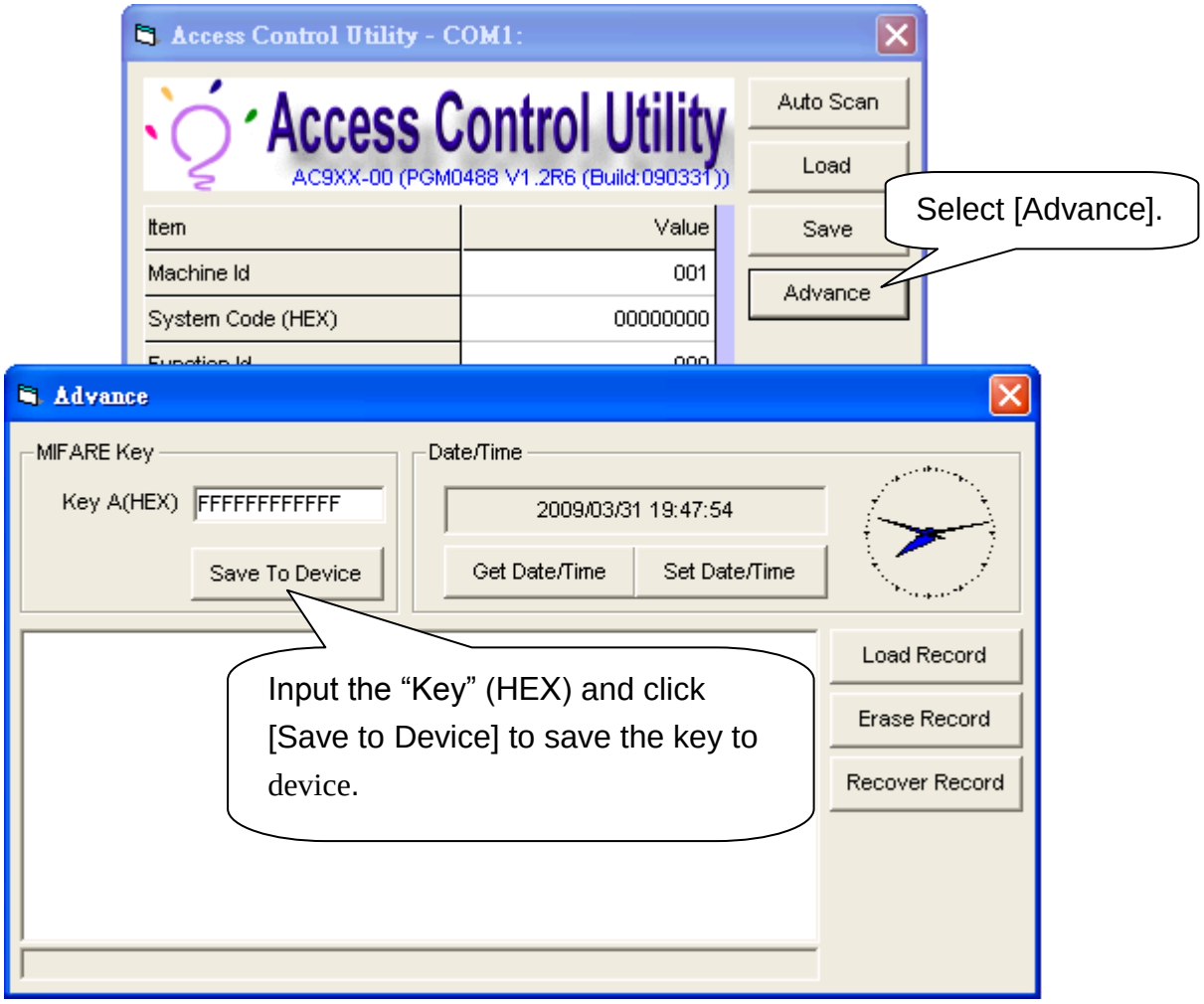
Click [Auto Scan] to detect any connection of device with the computer.



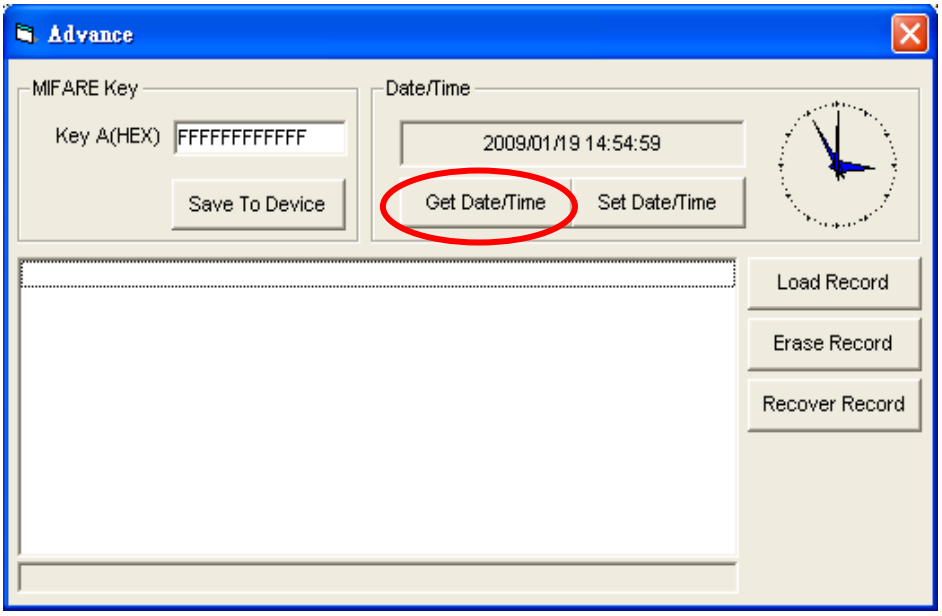
An device reader is found and the default values are listed.

Step 2: Save the Key to device.

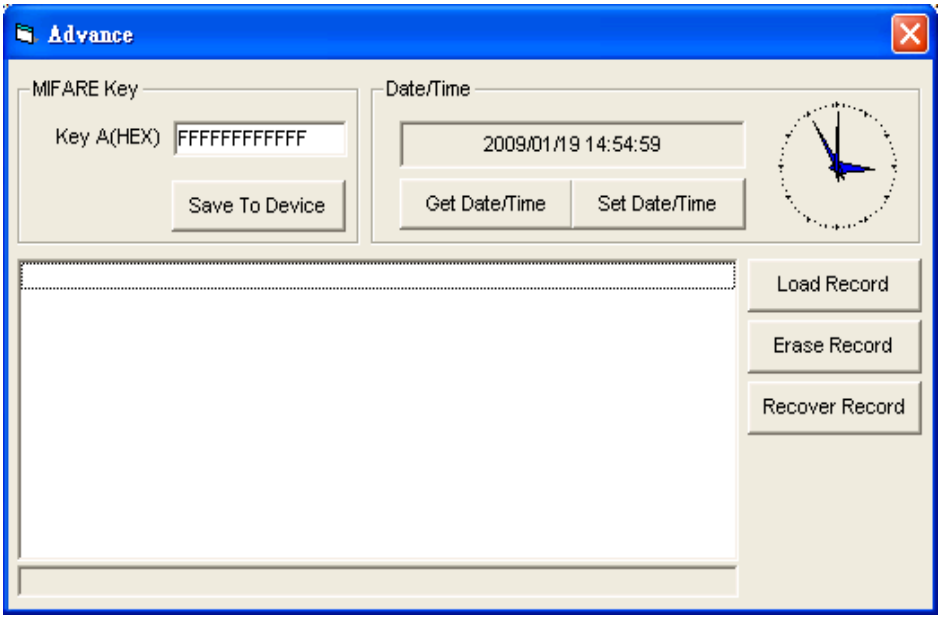
(Note: This Key must be the same as that saved to programmer PRW106.)



Step 3: Set the Date and Time of device.



Click [Get Date/Time] to get the current date and time settings of device.



Click [Set Date/Time] to set the current date and time of GMT (Greenwich Mean Time) to device from Internet.
Note: Make sure that your computer is connected with the Internet, or the date/time will be retrieved from your computer instead of GMT.

Close the “Advance” window to proceed the settings of device properties.

Step 4: Set the device Properties

1. **Machine ID: (Default : 0)**
   This ID is the Address of each device for communications purpose.
   If there is more than one device in the system, each device must have a single ID number in order to verify where the records are from.
   The MID (Machine ID) ranges from 1 to 255.

2. **System Code: (Default: 0)**
   This code is to verify if the card and device are of the same system. If the system code of the card is different from that of device, the card cannot be accepted by device. The system code must be the same as that saved to programmer PRW106.

3. **Function ID: (Default : 0)**
   This is mainly for on-site setting of the device properties by Manager Card. Readers of the same functioning group or decrement can have the same function ID. Manager Card is a reserved function for future. The FID (Function ID) ranges from 1 to 255. (S**ee Appendix-C**)

4. **Advance: (Default: Deny)**
   Advanced Consumption is considered when the balance of the card is above zero but insufficient for a transaction. If it is allowed, device will accept the insufficient-valued card just once as last transaction.

5. **Pay Mode: (Default : By Count)**
   There are 2 kinds of pay mode for option, one is *By Count* and the other is *By Time*.
   -Mode “By Count”: When a card is read by device, this card will be halted and the next transaction is not allowed until preset period time is up.
   -Mode “By Time”: When a card is read by device, it must stay with device during the period time to continue the next transaction in a row.

6. **DI1, Sensor: (Default : Normal Open)**
   It is used for sensing the status of the relayed device. Please refer to the device connection examples hereafter.
   -For payment system application, it is used for sensing the activation status of the device. If it senses the termination of the device before activation period ends, device is therefore ready for next transaction. It also can be connected with Safety Stop switch (optional).
   -For access control application, it can be connected with door sensor, setting for sensor type you are going to connect.

7. **DI2, Switch: (Default : Normal Open)**
   For access control application, it can be used to connect an Exit button switch to activate the door lock, setting for switch type you are going to connect.

8. **DI3, Tamper Sensor: (Default : Disable)**
   When tamper sensor is enabled, if device's housing is uncovered or vandalized, the alarm device connected to DO2 will be activated and sound.

9. **Value: (Default : 0)**
   Set the decrement value or amount required for using the device.
   Set the value to "0" for access control application and no deduction will be made from the card. (**See Appendix-D**)

10. **Delay Time: (Default : 0)**
    Set the duration that a card needs to be presented to device to complete the transaction. This is to avoid accidental reading when a card is within the reading range yet not meant for transaction.

11. **DO1, Period Time: (Default : 0)**
    Set the activation duration of the device connected with DO1. When the time is up, the device will be terminated accordingly.

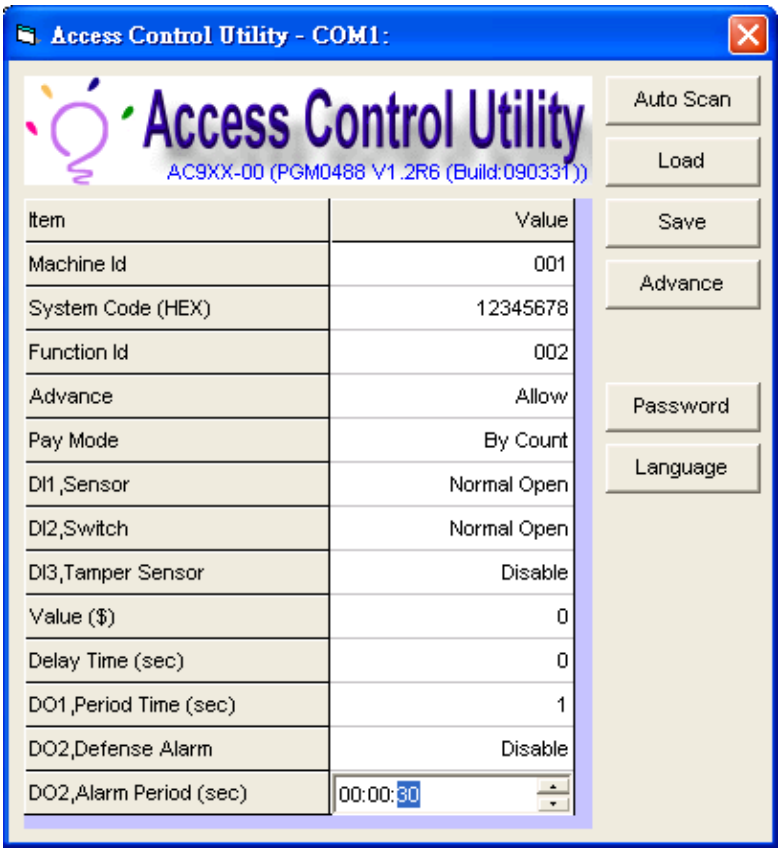
12. **DO2, Defense Alarm: (Default : Disable)**
    When Defense Alarm is enabled, if the device is activated without transaction, the alarm connected with DO2 will be activated.
    For access control application, the alarm connected with DO2 is to be activated when the door is opened illegally.

13. **DO2, Alarm Period: (Default : 0)**
    Set the duration of alarm activation. When the time is up, the connection with DO2 alarm ceases accordingly.

Note: The Correlation among DI1/Sensor, DI3/Tamper and DO2/Alarm

1. If DI1/Sensor is connected and DO2/Alarm is enabled:
   DI1/Sensor is used for sensing the status of the relayed device. If the device is activated (e.g. door is open) without card reading and authentication procedure, DO2/Alarm will be ringing according to the preset alarm period; and device's internal buzzer alarming as well.
2. If DI3/Tamper as well as DO2/Alarm are enabled:
   If DI3/Tamper detects the vandalism of device's housing, DO2/Alarm will be ringing according to the preset alarm period; and device's internal buzzer alarming until the housing is reverted.
3. No matter DO2/Alarm is enabled or not, device's internal buzzer will be alarming when the above-mentioned situations happen.

For example:

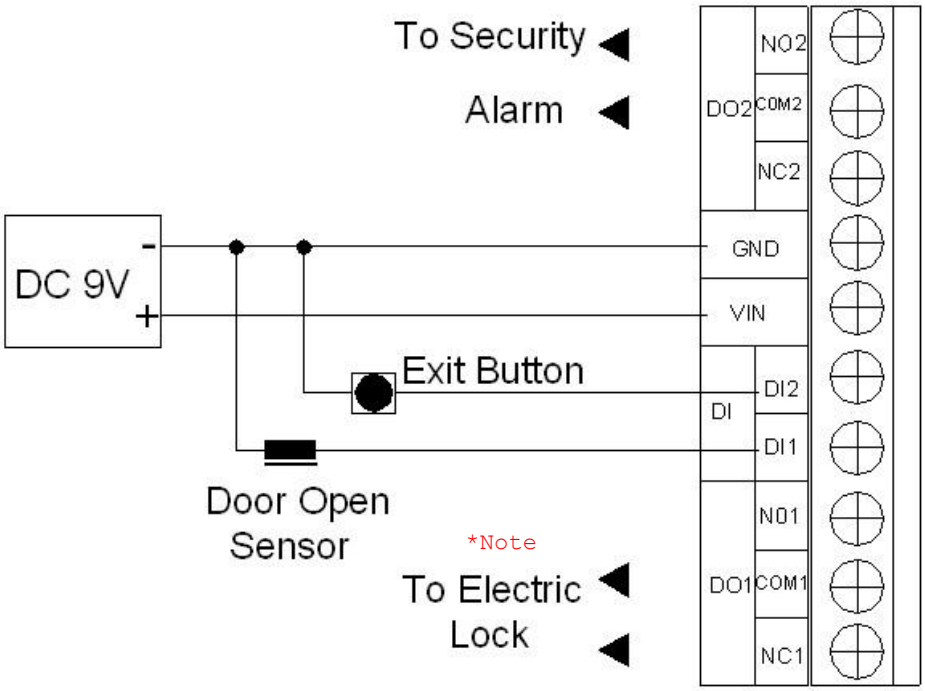


Other method:

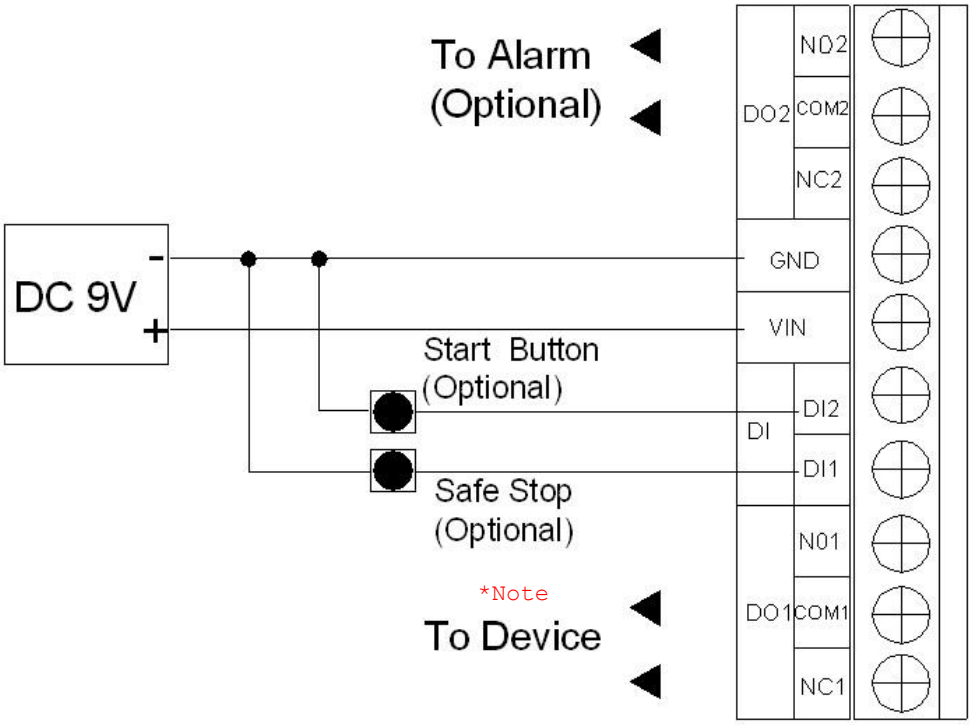
1. [**Load**]: Download the current properties of the on-line device to the computer.
2. [**Save**]: Save the properties from the current software to device itself.
3. [**Password**]: Change login password
4. [**Language**]: Change language of the software.

AC906 Connection Examples:

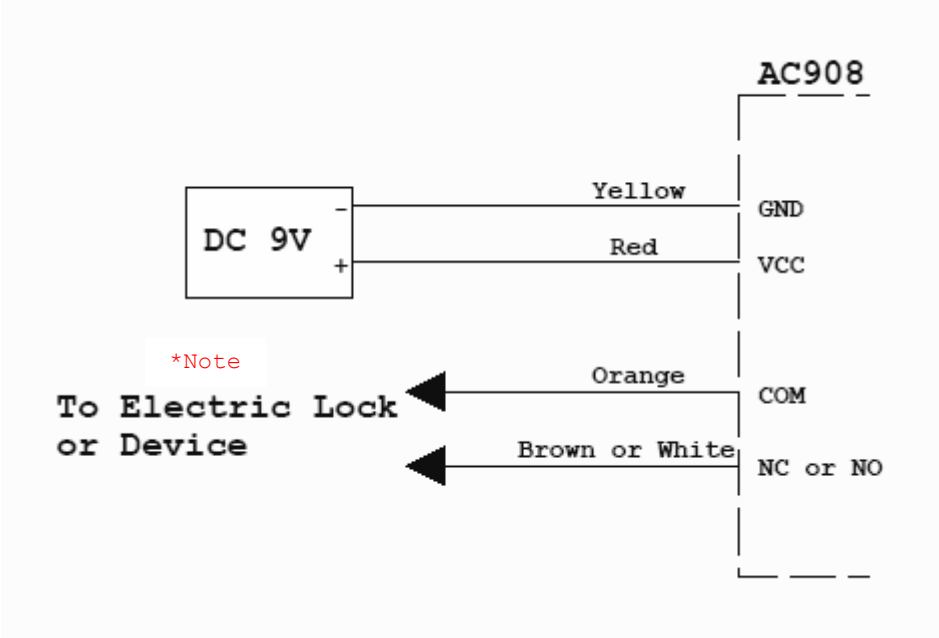
1. Connection for Access Control Application:



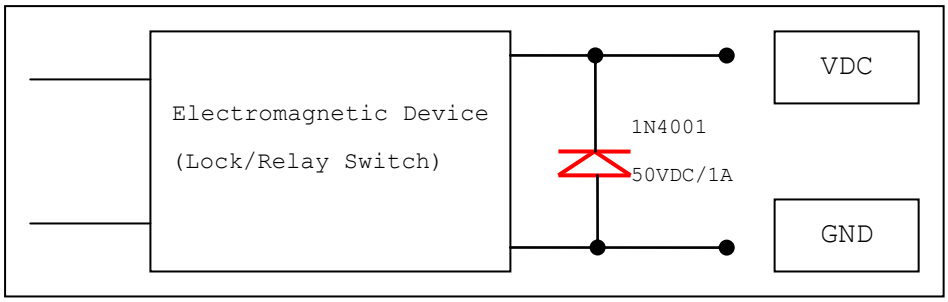
2. Connection for Payment System Application:



AC908 Connection Examples:

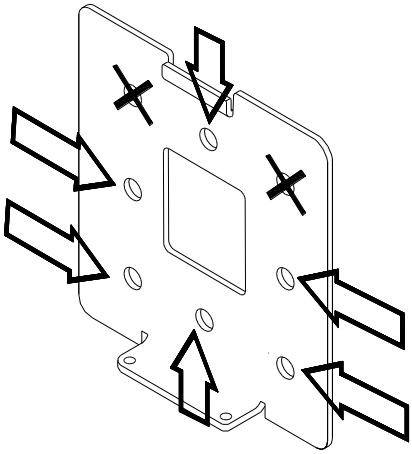


*Note For Electromagnetic Device (Lock or Relay switch)

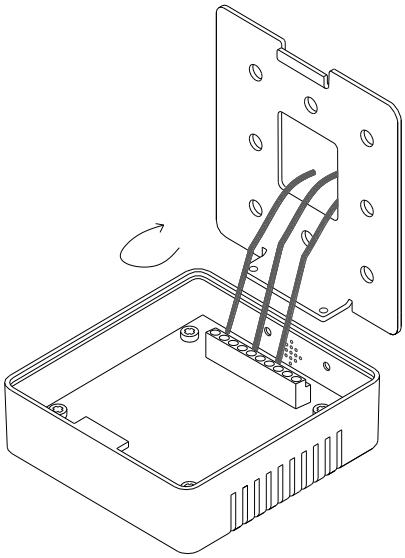


Adding a DIODE is recommended when connecting with electromagnetic device. This is to short-circuit the instantaneous inverse voltage produced by the power-on relayed device.

AC906 Installation

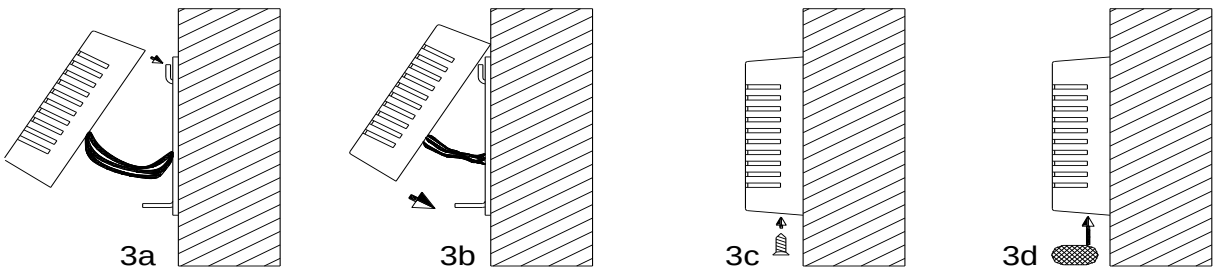


Make all wires come out of the wall through the square hole of the metal back-plate. Screw the metal back-plate to the wall via 6 mounting holes as the arrow positions on left Figure.



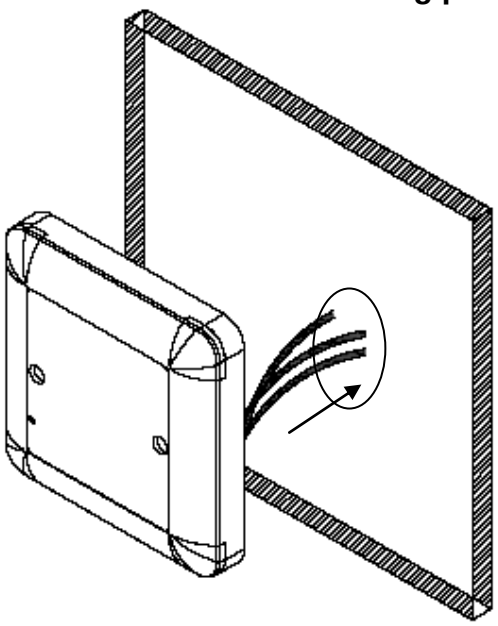
Connect all wires to their respective wire terminals and tighten the screws using screwdriver.

Close the AC906's top cover as shown on Fig. 3a and 3b. When closing the cover, be gentle with the wires. Pull excessively long wires back into the hole, only allow for a small wire loop inside the AC906; make sure that the wires do not interfere with the operation of the Tamper Sensor.

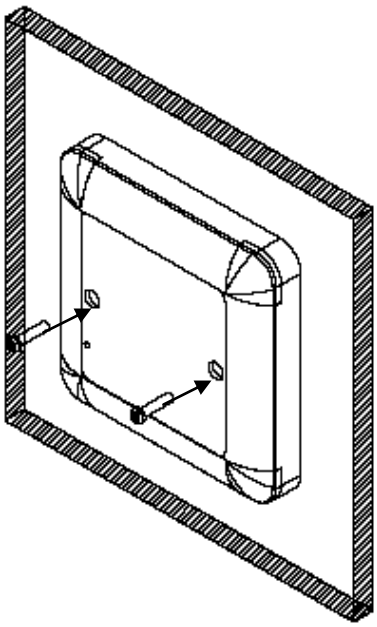


AC908 Installation

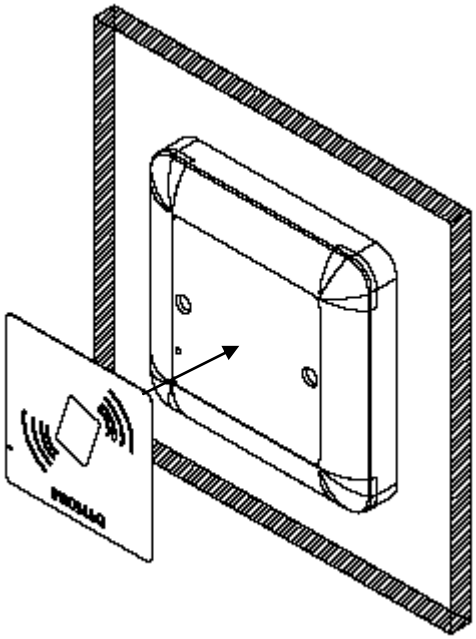
Step 1.Put all wires of AC908 through the hole of mounting place.



Step 2.Mount the AC908 by the screw.



Step 3.Mount the PROMAG logo plate on AC908.



Appendix-A

MIFARE® RWD SERIES SPECIFICATION

Products	AC906/AC908	PRW106	PCR310	MF5
Major Feature	Access Control	Card Issue	Card Issue	RWD OEM Module
RF Frequency	13.56MHz	13.56MHz	13.56MHz	13.56MHz
RF Distance	3 cm/5cm	3 cm	2 cm	5~6 cm (SK)
DC Power	9V/150mA	9V/100mA	5V/100mA	5V/100mA
RS232	19200,N,8,1	19200,N,8,1	19200,N,8,1	19200,N,8,1
Interface	RS232/RS485	RS232	USB/RS232	RS232 TTL
Protocol	GNET Plus	GNET Plus	GNET Plus	GNET Plus
CARD TYPE	ISO14443A MIFARE® Class MIFARE® PRO	ISO14443A MIFARE® Class MIFARE® PRO	ISO14443A MIFARE® Class MIFARE® PRO	ISO14443A MIFARE® Class MIFARE® PRO
RTC	I^2C RTC			
RECORD MEMORY	32KB	32KB	32KB	
Dimension (mm)	79.6x84.8x25/ 105X105X20.74	86x121.8x86	65x100x24.7	26x36x11
Weight	200g/325g	180g	115g	10g

AC906/AC908 Feature

Item	Value	
	AC906	AC908
MIFARE CARD CLASS	1K / 4K*	
RF Range	3~4 cm	5~6cm
Access Records	1600*	
Power Current (DC9V)	150mA	130mA
DO1/DO2* Max Current	0.25A/240ACV,0.5A/125ACV,1A/24DCV	
DI1/DI2 ESD	+/- 15KV	N/A
RS232 / ESD	19200,N,8,1 ESD:+/- 15KV	19200,N,8,1 ESD:+/- 13KV
RS485 / ESD	19200,N,8,1 ESD:+/- 10KV	N/A
RTC Battery Backup	3 DAYS	10 YEARS
Water Proof	No	Yes

*MIFARE-4K can be run on Payment System, but always access between sector 0 and sector 15 (1K).

*AC906 can store up to 1600 access records, and overwrites from the first record when the memory is full.

*DO2 is not available for AC908.

Appendix-B

AC906/AC908 Status Table:

Status	Beep	RED LED	GREEN LED
Power On / Reset	Long Sound (1 Sec)	OFF	ON
Key Error	3 Alarm	3 Flash	OFF
System Code Error	3 Alarm	3 Flash	OFF
Invalid Date/Time	6 Alarm	6 Flash	OFF
Card Record Failed	2 Alarm	2 Flash	OFF
Access Failed	6 Alarm	6 Flash	OFF

Appendix-C

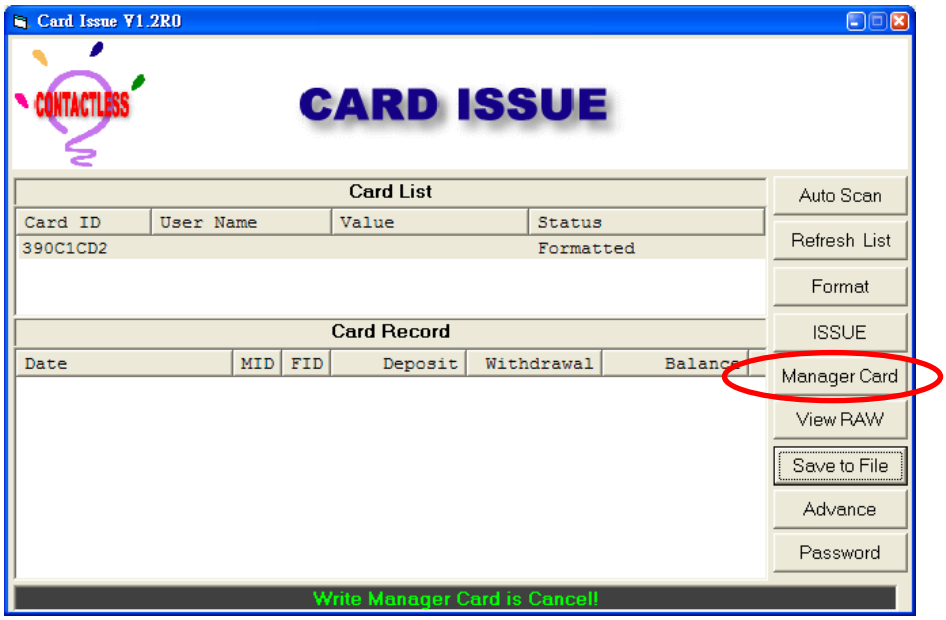
In addition to issuing the Cash Card for payment, the Card Issue Program can also issue the Manager Card for the on-site setting of AC906, A908…etc.

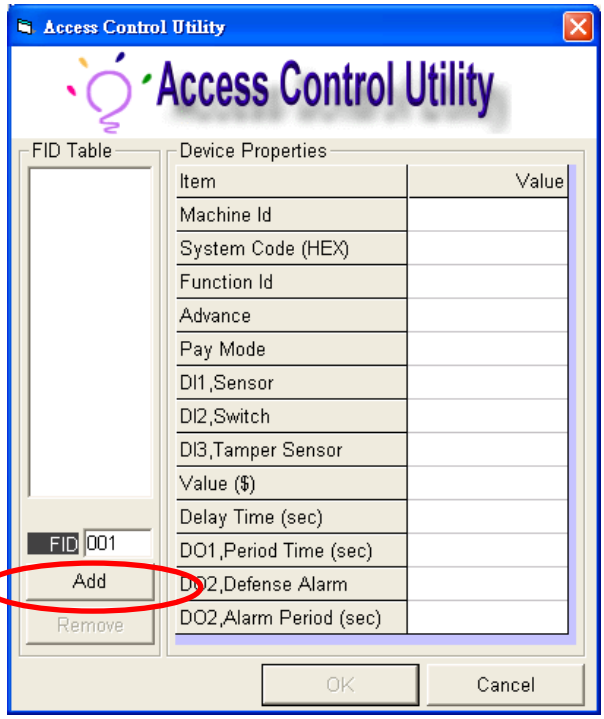
Because device is a stand-alone unit, it is not easy to change its configuration after it is installed. To avoid the hassle of un-installing AC906 and taking it back to PC or bringing a Laptop to where it is installed to change its settings, using a Manager Card with all device's settings stored in is the easiest and most convenient way to do it.

Issue Manager Card:

Use the Manager Card to configure the parameters of device after device is installed.

Step 1: Put a formatted card in Programmer (PRW106) and Click [Manager Card] button.

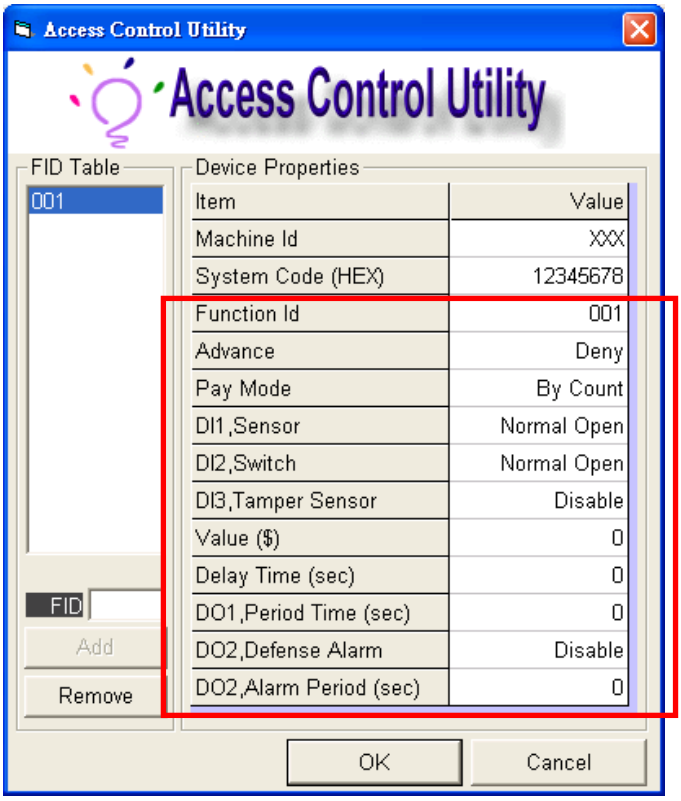




Step 2: Input FID and Click [Add] button. (Example: FID=001)

Note:
FID=Function ID of device, and range from 1 to 255.

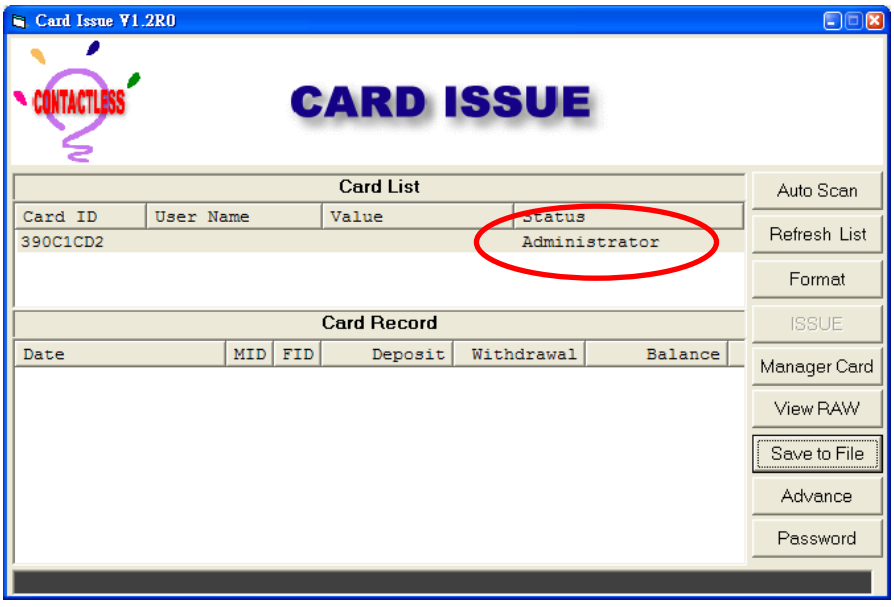
Step 3: Input parameters of device as below:



Remark: The “Machine Id”, “System Code” and “Function Id” are fixed and can not be changed.

Step 4: Add New FID in the Manager Card and repeat step 2~3.
Remark: Maximum 15 FIDs can be stored in one Manager Card.

Step 5: Click [OK] to issue the Manager Card and go back to the main window. The Status will show “Administrator” if the card is a manager card.

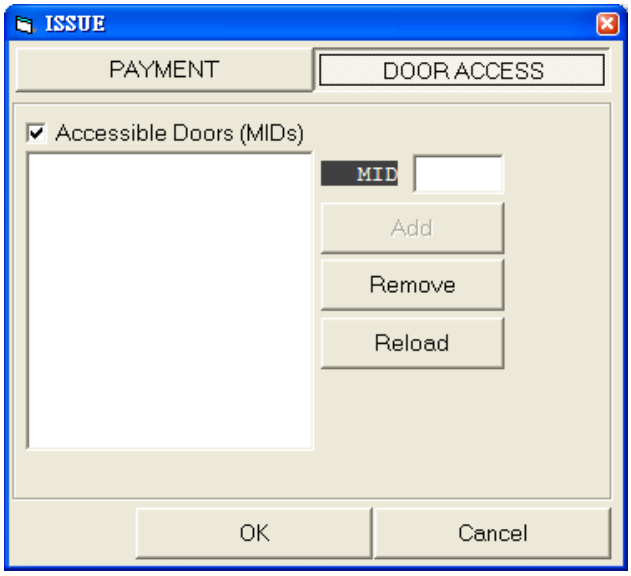


Appendix-D

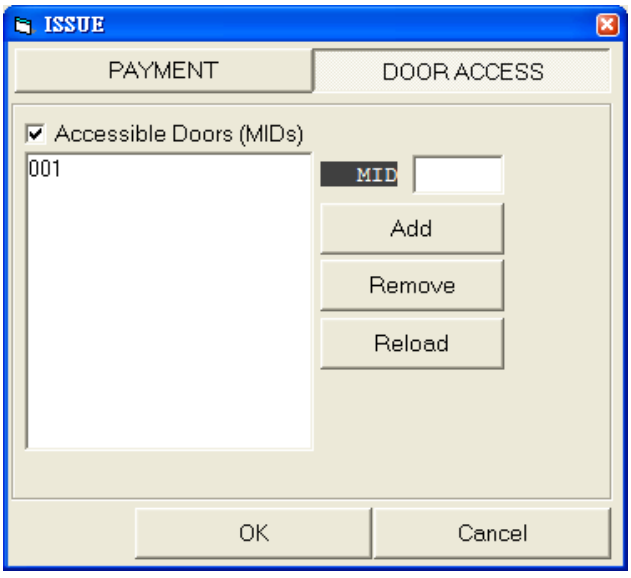
Issue Door Access Card:

AC906, A908…etc. can work as an Access Control reader when the decrement Value is set to “0”. That is, you can use only one card for both payment and door access.

Step 1: Click [Issue] and [DOOR ACCESS] to issue the Door Access Card.



Step 2: Input MID and Click [Add] button. (Example: Input “001” and click [Add] button)



Note:
MID=Machine ID of device, ranges from 1 to 255

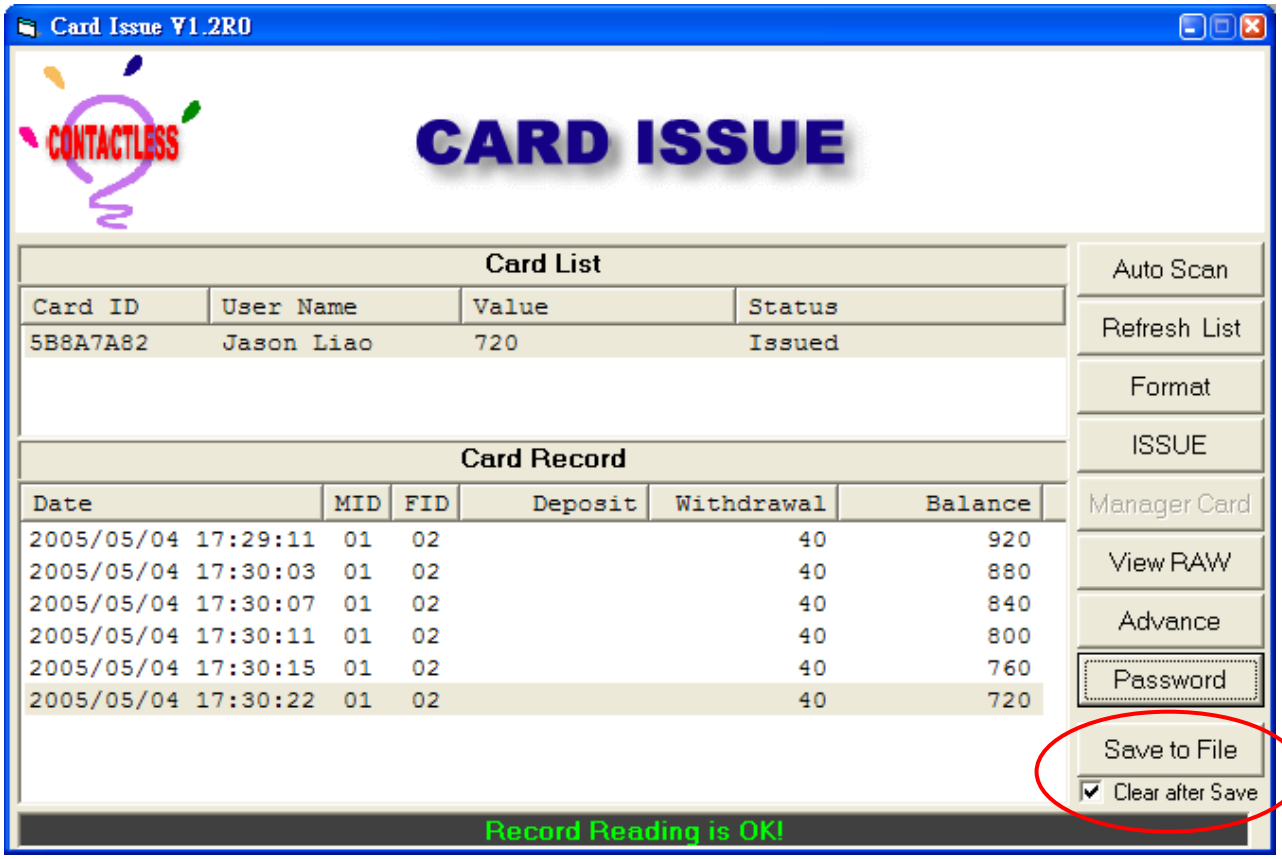
Remark: The MID is the Machine No. of device installed outside of each door.

Note:
Maximum 16 MID can be stored in User Card. (Cash Card)

Appendix-E

Save and Clear all records of Cash Card:

You must Save and Clear all records of Cash Card when the card records are full and the “No TRANSACTION when the card records are full” option is enabled. If not, the Cash Card can not be used.



Note:

If “Clear after Save” option is enabled, the all records will be clear after “Save to File”.

Appendix-F

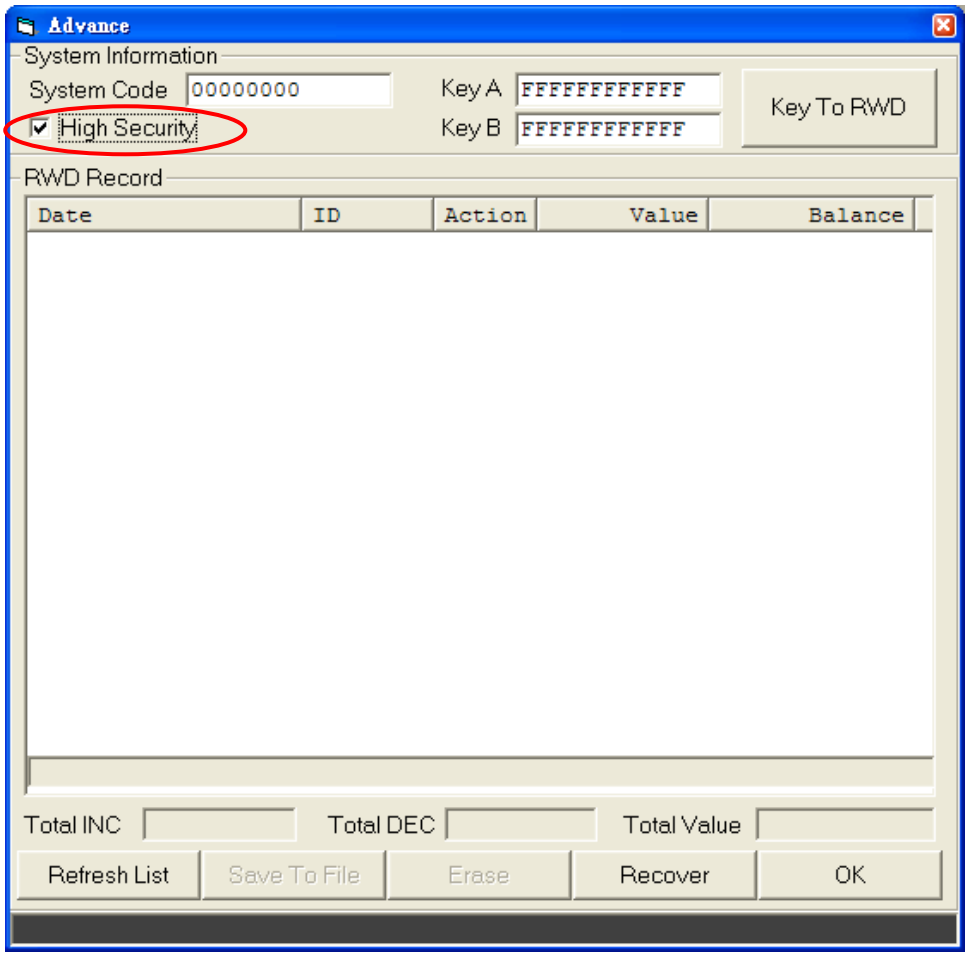
- **Password Level Table:**

For software security, you must input password to logon the “Card Issuer” and “Access Control Utility” software. Different password supports different operation level as below:

	Advance	Manager Card	Issue Cash Card	Access Control Utility
Administrator	●	●	●	●
User			●	●

- **High Security:**

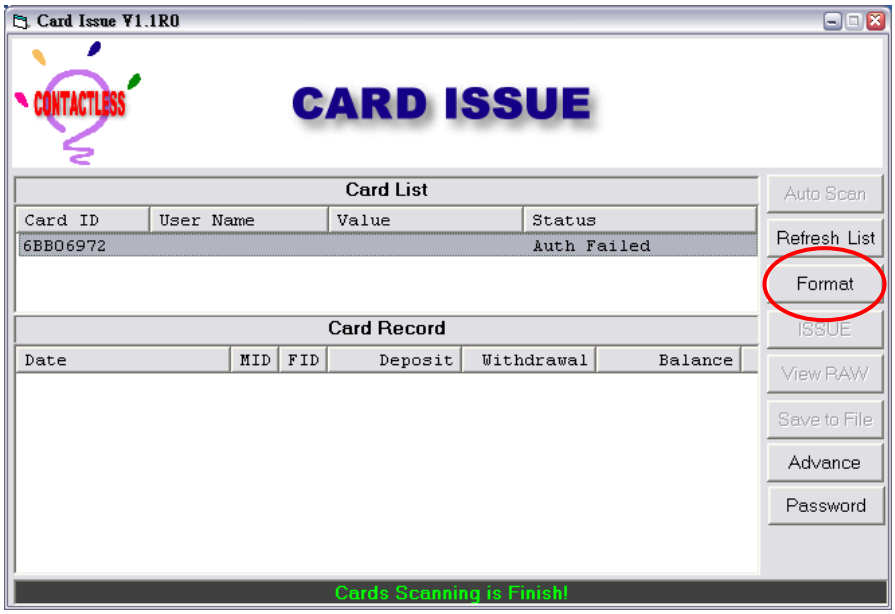
To have higher security level, we provide new the setting. If “High Security” option is enabled, the “Card Issue” will set 2 Mifare® Keys (Key-A and Key-B) into the Cash Card. The Key-A is with “Read” and “Decrement” level only, and Key-B is with full access level to the Cash Card. (Note: AC906 is with Key-A only)



Appendix-G

How to Re-format an Issued Card?

1. Run CardIssue program.
2. Put the Issued Card on PRW106, the status will show “Auth Failed” for the issued card, which means that the key of the issued card is different from that of the current program.

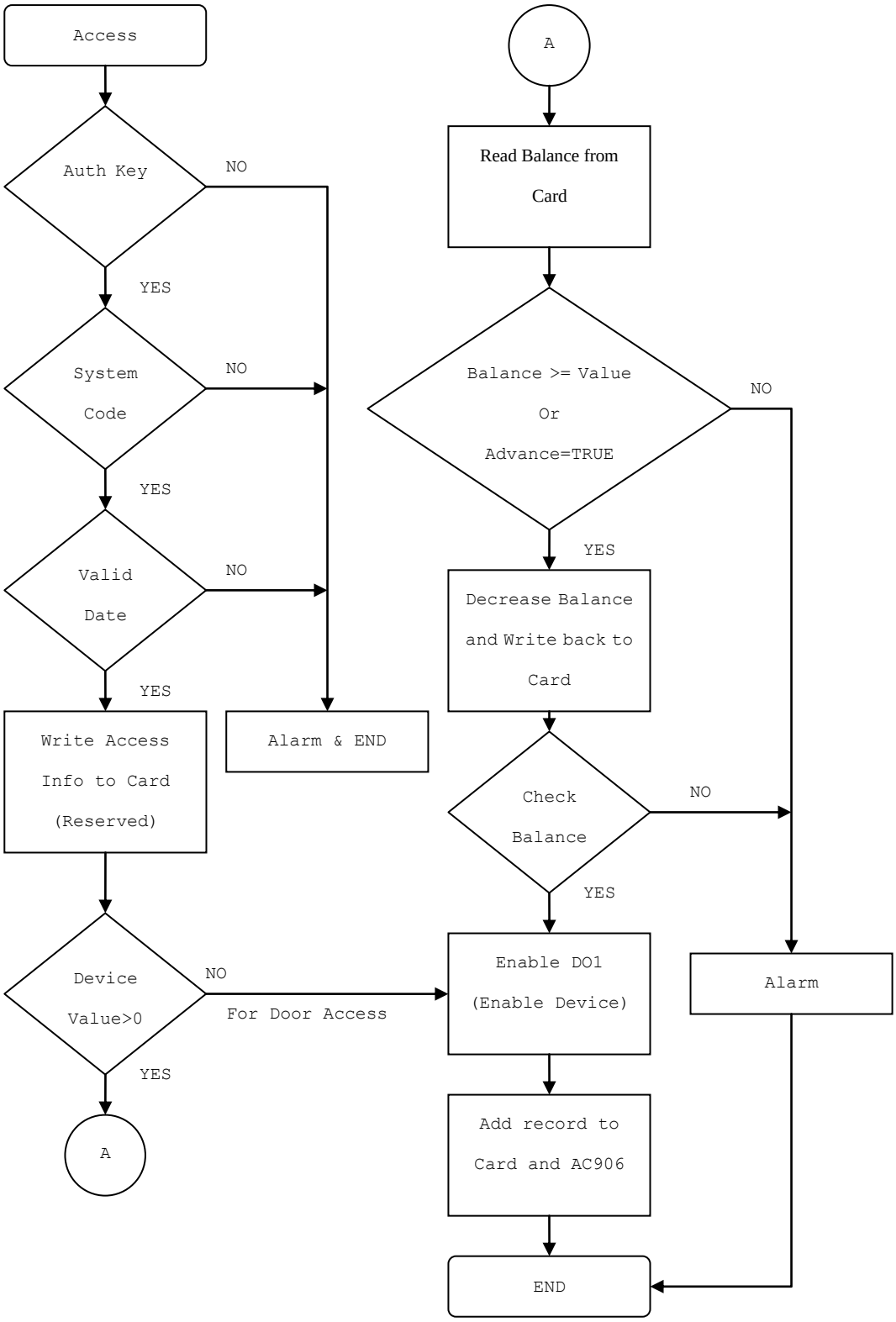


3. Click “Format”
4. CardIssue will ask for the Old Key and then begin formatting it with new system-code and Key.

Remark : You need to know the old key for the issued card when you want to reformat the issued card.

Appendix-H

AC906 Operation Flow Chart (for Payment):



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